

Reference Guide for Fire Model Keywords

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DUFFPROD

This is a landscape-level keyword. This keyword allows users to set the proportion of the decayed material that goes into the duff pool. The remainder goes to the air.

- Field 1: Decay rate pool. This value must be present for the keyword to take effect.
Range: 1-4 for the pool number or 5 for all pools.
- Field 2: Proportion of decayed litter.
- Field 3: Proportion of decayed fuel 0-0.25".
- Field 4: Proportion of decayed fuel 0.25" - 1".
- Field 5: Proportion of decayed fuel 1" - 3".
- Field 6: Proportion of decayed fuel > 3".
- Field 7: value for **all** size classes.

Supplemental Record: none

Variant	1	2	3	4	5	6	7
All Variants		0.1	0.1	0.1	0.1	0.1	

END

This is a landscape or stand-level keyword. This keyword tells FVS that it is done reading the fire model keywords. The keyword must be used after the keyword FMIN or FMPPIN.

Fields 1-7: Not used.

Supplemental Record: none

Variant	1	2	3	4	5	6	7
All Variants		0.1	0.1	0.1	0.1	0.1	

Example:

FVS keywords
FMIN
Fire model keywords
END
FVS keywords

FIRECOND

This is a stand-level keyword only. This keyword sets the conditions under which the fire will occur: wind, temperature, season, moisture-level, and whether it is "wild" or "prescribed", for each stand and year. This keyword or the FIRETYPE keyword **must** be present for a fire to occur

- Field 1: Calendar year.
 Field 2: Not used.
 Field 3: Wind level at 20 feet above ground level (mph).
 Field 4: Select a pre-set moisture level (rather than using the MOISTURE keyword).
 Values, from driest to wettest are: 1,2,3,4..
 Field 5: Temperature (°F).
 Field 6: If blank or 0 then fire is a wildfire.
 If greater than 0 then fire is prescribed.
 Field 7: Not used.

Supplemental Record: none

Variant	1	2	3	4	5	6	7
All Variants	initial year		20*	1	70		

* unless field 6 is greater than 0, in which case field 3 default is 6.

FIREREPT

This is a landscape-level keyword. This keyword lists which output files will be printed at the time of a fire. The PPE-keyword OPEN must be used to open files with the given unit numbers.

File Types:

- 1 - Burn conditions report
- 2 - Fuel consumption and physical effects
- 3 - Tree mortality (% trees in each size class which are killed)

Field 1: Unit number to use when printing the burn conditions report (file type 1).
 Field 2: Unit number to use when printing the fuel consumption report (file type 2).
 Field 3: Unit number to use when printing the tree mortality report (file type 3).
 Field 4: Print headings? 0 or blank = yes; 1 = no.
 Fields 5-7: Not used.

Supplemental Record: none

Variant	1	2	3	4	5	6	7
All Variants	31	32	33	0			

FIRETYPE

This is a stand-level keyword only. This keyword selects the type of fire for the given stands in the given years. This keyword or the FIRECOND keyword **must** be present for a fire to occur.

Field 1: Calendar year.
 Field 2: Not used.
 Field 3: Type of fire: 1 = free-burning; 2 = throttle-back, 3 = mass-ignition.
 Field 4: Flame-length (feet).
 Field 5: Flame-length multiplier.
 Field 6: Percent of the crown undergoing crowning (If blank or "-1" then the model will choose a percent based on canopy closure and cover type).
 Field 7: Not used.

Supplemental Record: none

Variant	1	2	3	4	5	6	7
All Variants	initial year		1		1*	-1	

* If field 3 is 1 then field 5 default is 1.
 If field 3 is 2 then field 5 default is 0.3.
 If field 3 is 3 then field 5 default is 2.0.

FMIN

This is a stand-level keyword. This keyword tells FVS that the keywords following it are part of the fire model. The keyword END signifies the end of the fire model keywords.

Fields 1-7: Not used.

Supplemental Record: none

Variant	1	2	3	4	5	6	7
All Variants		0.1	0.1	0.1	0.1	0.1	

Example:

FVS keywords
FMIN
Fire model keywords
END
FVS keywords

FMPPIN

This is a landscape-level keyword. This keyword tells the PPE that the keywords following it are part of the fire model. The keyword END signifies the end of the fire model keywords.

Fields 1-7: Not used.

Supplemental Record: none

Variant	1	2	3	4	5	6	7
All Variants		0.1	0.1	0.1	0.1	0.1	

Example:

PPE keywords
FMPPIN
Fire model keywords
END
PPE keywords

FUELBURN

This is a stand-level keyword only. This keyword allows users to burn fuels in a jackpot burn or a pile burn, in the specified stands(s) and year.

- Field 1: Calendar year in which the treatment occurs.
 Field 2: Not used.
 Field 3: Type of fuel treatment: 1 = pile burn; 2 = jackpot burn.
 Field 4: Percent of the stand's area affected by the treatment.
 Field 5: Percent of the stand's affected area in which the fuel is concentrated (area which will be treated).
 Field 6: Percent of the fuel from the affected area that is concentrated in the treated area.
 Field 7: Percent mortality of trees in the stand (as a result of the fuel treatment).

Supplemental Record: none

Variant	1	2	3	4	5	6	7
All Variants ~	initial year		1	70*	10*	80*	0*

* If field 3 = 2 (jackpot burn) then default values are:

- Field 4 = 100
 Field 5 = 30
 Field 6 = 65
 Field 7 = 0.5

FUELDCAY

This is a landscape-level keyword. This keyword sets the total decay rates for different size classes for different decay "pools".

Field 1: Decay class. This keyword must be present for keyword to take effect.
 Range: 1 - 4 for the pool number or 5 for **all** pools.
 Field 2: Litter decay rate.
 Field 3: Duff decay rate.
 Field 4: 0 - 0.25" decay rate.
 Field 5: 0.25 - 1" decay rate.
 Field 6: 1 - 3" decay rate.
 Field 7: > 3" decay rate.

Supplemental Record: none

Variant	1	2	3	4	5	6	7
All Variants		0.5	.002	*	*	*	*

* Default for values are:
 if field 1 = 1 : 0.007
 = 2 : 0.010
 = 3 : 0.011
 = 4 : 0.018

FUELINIT

This is a stand-level keyword only. This keyword allows users to change the initial fuel values in selected stands.

Field 1: Not used.
 Field 2: Initial fuel level for fuels < 3" (tons/acre).
 Field 3: Initial fuel level for fuels 3-6" (tons/acre).
 Field 4: Initial fuel level for fuels 6-12" (tons/acre).
 Field 5: Initial fuel level for fuels >12" (tons/acre).
 Field 6: Initial fuel level for Litter (tons/acre).
 Field 7: Initial fuel level for duff (tons/acre).

Supplemental Record: none

Variant	1	2	3	4	5	6	7
All variants: sp 1		1.8	10.0	10.0	10.0	.8	30
2		1.7	3.5	3.5	0	.6	10.0
3		1.7	3.5	3.5	0	.6	10.0
4		2.2	7.0	7.0	0	.6	25
5		4.8	15	20	15	1.0	35
6		4.8	15	20	15	1.0	35
7		1.5	7.0	8.0	0	.6	15.0
8		2.2	10.0	10.0	0	.6	30
9		2.2	10	10	0	.6	30
10		1.5	2.5	2.5	0	1.4	5.0
11		2.2	10	10	0	.6	30

FUELOUT

This is a stand-level keyword only. This keyword requests the stand level output table for **all** fuels. The PPE-keyword OPEN must be used to open files with the given unit numbers. Note that if any of the instances of this keyword requests no table headings, none will be printed.

Field 1: Start calendar year.
 Field 2: Ending calendar year.
 Field 3: Not used.
 Field 4: Unit for printing.
 Field 5: Interval for printing.
 Field 6: Print table headings? 0 or blank = yes; 1 = no.
 Field 7: Not used.

Supplemental Record: none

Variant	1	2	3	4	5	6	7
All Variants	initial year	final year		39	5	0	

FUELPOOL

This is a landscape-level keyword. This keyword allows users to set the decay pool that each species belongs to. The four decay pools are:

- 1 = very slow
- 2 = slow
- 3 = medium
- 4 = fast

- Field 1: Species number. Range: 1-11 for the individual species or a "0" to indicate **all** species. If a "0" is used, a supplemental record is required.
- Field 2: New decay pool. (Range: 1-4) This is only used if field 1 contains a value from 1 to 11.
- Fields 3-7: Not used.

Supplemental Record: This is required if a "0" was entered into field 1. Eleven values **must** be added (no defaults are carried). The values must be added with only 1 space between each integer value.

Variant	1	2	3 -	4	5	6	7
All Variants							

Defaults by Tree Species											
	1	2	3	4	5	6	7	8	9	10	11
All Variants	4	3	1	3	2	2	4	2	1	4	4

FUELTRET

This is a stand-level keyword only. This keyword sets the type of fuel treatment that was done (if any) and the type of harvest. Note that this keyword affects fire intensity only (by changing depth) and only for five years after the stand entry.

- Field 1: Year.
 Field 2: Not used.
 Field 3: Fuel treatment type:
 0 = none
 1 = lopping or flailing
 2 = trampling, chopping, crushing or chipping
 Field 4: Harvest type:
 1 = ground-based, cat skidding or line skidding
 2 = high lead or skyline
 3 = precommercial or helicopter
 Field 5: Multiplier used to increase or decrease fuel depth.
 Fields 6-7: Not used.

Supplemental Record: none

Variant	1	2	3	4	5	6	7
All Variants	initial year		0	1	*		

* defaults by fuel treatment and harvest type

Harvest Method (field 4)	Fuel Treatment (field 3)		
	0	1	2
1	1.0	.83	.75
2	1.3	.83	.75
3	1.6	.83	.75

LANDOUT

This is a landscape-level keyword. This keyword requests the printing of the landscape-level tables. If a negative value is entered, or if the keyword is not used, the file will not be printed. The PPE-keyword OPEN must be used to open files with the given unit numbers.

- Field 1: Unit for printing the table giving the loading categories for fuels and snags
 Field 2: Unit for printing the table summarizing the number of acres in each fuel model
 Field 3: Unit for printing the table giving landscape-level flame effects and potential flame density (if calculated).
 Fields 4-5: Flame lengths used for grouping the landscape-level. Area will be printed as:
 all area less than Field 4
 all area greater than Field 4
 all area greater than Field 5.
 Field 6: Print table headings? 0 or blank = yes; 1 = no.
 Field 7: Not used.

Supplemental Record: none

Variant	1	2	3	4	5	6	7
All Variants	36	37	38	4	8	0	

MOISTURE

This is a stand-level keyword only. This keyword sets the fuel moisture conditions for the different fuel categories in the given stands and years.

- Field 1: Year (calendar year).
- Field 2: Not used.
- Field 3: Moisture value for 1 hour fuels.
- Field 4: Moisture value for 10 hour fuels.
- Field 5: Moisture value for 100 hour fuels.
- Field 6: Moisture value for Duff fuels.
- Field 7: Moisture value for 3+ fuels.

Supplemental Record: Row 1: Moisture value for live fuels.

Variant	1	2	3	4	5	6	7
All Variants	initial year						

POTFLAME

This is a landscape-level keyword. This keyword requests a report on the potential flame lengths resulting from different moisture levels in all stands in the given years. The PPE-keyword OPEN must be used to open files with the given unit numbers.

- Field 1: Start calendar year.
 Field 2: Ending calendar year.
 Field 3: Interval to print (e.g. every 5 years).
 Field 4: Unit number on which to print the report.
 Field 5: Print headers for file? 0 or blank means print headers, any other numerical value means do not print headers (i.e. file will be machine readable).
 Fields 6 - 7: Not used.

Supplemental Record: none

Variant	1	2	3	4	5	6	7
All Variants	initial year	final year	10	34	0		

SALVAGE

This is a stand-level keyword only. This keyword allows users to remove snags (dead standing trees) of given sizes and decay states. Remember that snags are only added to the treelist at cycle boundaries. For example, to remove snags created from a fire in 1997, the salvage must occur in 2000 or later (assuming that 2000 is the cycle boundary).

- Field 1: Year (calendar year).
- Field 2: Not used.
- Field 3: Minimum dbh to be removed.
- Field 4: Maximum dbh to be removed.
- Field 5: Maximum number of years the removed snags can have been dead.
- Field 6: Decay state to remove: 0 = hard snags only; 1 = hard and soft snags.
- Field 7: Portion of eligible snags to remove.

Supplemental Record: none

Variant	1	2	3	4	5	6	7
All Variants --	initial year		10	999	5	0	0.9

SNAGBRK

This is a landscape-level keyword. This keyword sets the parameters for “breaking” (or causing height loss to) the standing snags. The “correction factor” can be specified by species.

- Field 1: Species for which to change height loss parameter (Field 2). If Field 1 is left blank or 0 is entered, a supplemental record is required (see below). Otherwise a number less than 0 or a valid species number (1-11) must be entered.
- Field 2: Rate-of-height loss correction factor for given species (Range: ≥ 0). Higher values mean that height is lost faster.
- Field 3: Proportion of snags that are soft at death (Range: 0 - 1).
- Field 4: Height loss correction factor for initially soft snags (Range ≥ 1).
- Field 5: Base rate of height loss for first 50% of height (Range: 0 - 1).
- Field 6: Base rate of height loss for second 50% of height (Range 0-1).
- Field 7: Not used.

Supplemental Record: Required if Field 1 is 0 or blank. Values must be entered for each of the 11 species. Each number can take up to 5 spaces and be of the format FS.2.

Variant	1	2	3	4	5	6	7
All Variants	0		0.0	2.0	0.0228	0.01	

Defaults by Tree Species											
	1	2	3	4	5	6	7	8	9	10	11
All Variants	0.9	0.9	0.9	1.1	1.1	1.1	1.1	1.1	1.1	1.0	1.0

SNAGCLAS

This is a landscape-level keyword. This keyword sets the boundaries for the six snag-dbh size classes which are used for printing. Note that, for best results, entered values should be even numbers.

All fields after an entered field are assumed to be "not used", i.e., the lower bound = 999.

Fields 1 - 6: Lower boundary for each size class.
(Maximum = 36)

Field 7: Not used.

Supplemental Record: none

Variant	1	2	3	4	5	6	7
All Variants	0	12	18	24	30	36	

SNAGDCAY

This is a landscape-level keyword. This keyword sets the snag decay rate parameters for each species. Decay is the change in the snag from hard to soft.

Field 1: Species for which to change the rate of decay. If Field 1 is left blank or 0 is entered, a supplemental record is required (see below). Otherwise a valid species number (1-11) must be entered.

Field 2: Rate-of-decay correction factor for given species (Range: ≥ 0). Higher values mean an increasing amount of time before the snag changes from hard to soft.

Fields 3 - 7: Not used.

Supplemental Record: Required if Field 1 is 0 or blank. Values must be entered for each of the 11 species. Each number can take up to 5 spaces and be of the format FS.2.

Variant	1	2	3	4	5	6	7
All Variants							

Defaults by Tree Species											
	1	2	3	4	5	6	7	8	9	10	11
All Variants	1.1	1.1	1.1	0.9	0.9	0.9	0.9	0.9	0.9	1.0	1.0

SNAGFALL

This is a landscape-level keyword. This keyword sets the snag decay rate parameters for each species.

- Field 1: Species for which to change the fall rate parameters. If Field 1 is left blank or 0 is entered, two supplemental records are required (see below). Otherwise a valid species number (1-11) or a value less than 0 must be entered. See below for details on the valid entries.
- Field 2: Rate-of-fall correction factor for given species (affects first 95% of snags to fall, minimum = 0.001). Higher values mean that the snags will fall faster.
- Field 3: Age by which last 5% of snags have fallen for given species (≥ 0).
- Fields 4 - 7: Not used.

Supplemental Record: Two supplemental records are required if Field 1 is 0 or blank. Only one record is required if Field 1 is -1 or -2. Values must be entered for each of the 11 species. Each number can take up to 5 spaces and be of the format F5.2.

Variant	1	2	3	4	5	6	7
All Variants	0						

Rate of Fall

Defaults by Tree Species											
	1	2	3	4	5	6	7	8	9	10	11
All Variants	0.9	0.9	0.9	1.1	1.1	1.1	1.1	1.1	1.1	1.0	1.0

5% Age

Defaults by Tree Species											
	1	2	3	4	5	6	7	8	9	10	11
All Variants	110	110	110	90	90	90	90	90	90	100	100

Valid entries are:

- 0 or blank = both values for all species will be entered. 2 supplemental records are required.
- 1-11 = values for the specified species (1-11) will be in fields 2 and 3.
- 1 = rate of fall correction factors for all species will be in the supplemental record.
- 2 = age values for all species will be in the supplemental record.

SNAGINIT

This is a stand-level keyword only.

Field 1: Not used.
Field 2: Species code of the snag (Range: 1-11).
Field 3: dbh at the time of death.
Field 4: Height at the time of death.
Field 5: Current height.
Field 6: Age (number of years tree has been dead).
Field 7: Density of snags with these characteristics.

Supplemental Record: none

Variant	1	2	3	4	5	6	7
All Variants							

SNAGOUT

This is a stand-level keyword only. This keyword selects years and stands for printing the snag output table. The PPE-keyword OPEN must be used to open files with the given unit numbers. Note that if any of the instances of this keyword requests no table headings, none will be printed.

Field 1: Start calendar year.
 Field 2: Ending calendar year.
 Field 3: Not used.
 Field 4: Unit for printing.
 Field 5: Interval for printing.
 Field 6: Print table headings? 0 or blank = yes; 1 = no.
 Field 7: Not used.

Supplemental Record:

Variant	1	2	3	4	5	6	7
All Variants _	initial year	final year		35	5	0	

SNAGPBN

This is a landscape-level keyword. This keyword controls the rate at which snags fall after a burn.

- Field 1: Proportion of **soft** snags which will fall faster after a fire. (Range: 0-1.0).
 Field 2: Proportion of **small** snags which will fall faster after a fire. (Range 0-1.0).
 Field 3: Number of years it will take for these snags to all fall. (Range: ≥ 1).
 Field 4: dbh which divides small snags from large snags. (Range: ≥ 0).
 Field 5: Scorch height above which this increased rate of fall will apply.
 Fields 6-7: Not used.

Supplemental Record: none

Variant	1	2	3	4	5	6	7
All Variants	1.0	0.9	7	12	0		

STATFUEL

This is a landscape-level keyword. This keyword allows users to use the static fuel models for selecting the parameters used in calculating fire intensity..

Fields 1-7: Not used.

Supplemental Record: none

Variant	1	2	3	4	5	6	7
All Variants							

YARDLOSS

This is a stand-level keyword but is **not** a fire model keyword. This keyword is included in this keyword guide because it is a new keyword that is useful for modeling snags and fuel. This keyword allows users to prescribe the proportion of wastage resulting from any scheduled cutting activity.

Field 1: Date or cycle.
 Field 2: Proportion of harvested stems not removed from stand.
 Field 3: Proportion of non-removed harvest that is down (i.e. not snags).
 Field 4: Proportion of crowns remaining in stand from removed stems.
 Fields 5-7: Not used.

Supplemental Record: none

Variant	1	2	3	4	5	6	7
All Variants		0.0	0.0	1.0			